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(54) REINFORCED TRIM COVER FOR A VEHICLE SEAT ASSEMBLY WITH A TEAR LINE FOR AIRBAG DEPLOYMENT

VERSTÄRKTER ÜBERZUG EINES FAHRZEUGSITZES MIT EINER SOLLBRUCHSTELLE FÜR DIE ENTFALTUNG EINES LUFTSACKES

GARNITURE INTERIEURE RENFORCEE, DESTINEE A UN SIEGE DE VEHICULE ET PRESENTANT UNE LIGNE DE DECHIREMENT SERVANT AU DEPLOIEMENT D'UN COUSSIN GONFLABLE

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(73) Proprietor: **Johnson Controls Technology Company**
Plymouth, Michigan 48170 (US)

(72) Inventors:
- **WU, Wei-Pin**
  Canton, MI 48187 (US)
- **WU, Frank K,**
  Novi, MI 48374 (US)
- **SHURTLEFF, Walton, H.**
  Brighton, MI 48114 (US)

(74) Representative: **Solf, Alexander, Dr.**
Patentanwälte
Dr. Solf & Zapf
Candidplatz 15
81543 München (DE)

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Description

BACKGROUND AND SUMMARY OF THE INVENTION

[0001] The present invention relates generally to a vehicle seat having an inflatable airbag contained therein and in particular to a trim cover for the seat having a reinforced region adjacent the airbag with a weakened zone forming a tear line for deployment of the airbag through the trim cover.

[0002] Generally, seat mounted airbag systems fall into two different categories known as class A and class B. A class A airbag deploys from a visible, discreet door in the seat. A class B airbag is disposed beneath the seat trim cover and is designed to deploy through the trim cover without the use of a visible door. An advantage of a class A airbag with the visible door is that deployment of the airbag through the door uses technology that has already been developed for front crash airbags mounted in steering wheels and instrument panels. The technology for providing consistent and repeatable deployment of the airbag through such a door is well developed. A class B airbag is often preferred for styling considerations. A disadvantage of a class A airbag is that the airbag location in the seat is generally limited to the side or rear of the seat so that the visible door is not part of the seating surface engaged by a seat occupant. If it is desired for an airbag to deploy through a front corner of the seat back, such as the bolster area, it may not be possible to use a class A airbag since the door may interfere with the seating surface of the seat. Rather, class B airbag must be used in which the airbag is underneath the seat trim cover and typically covered by a foam pad so that it does not adversely impact the seat comfort. However, with a class B airbag, there are considerably more variables involved with providing consistent airbag deployment and in meeting the desired airbag in-position timing.

[0003] The seat trim cover provides numerous variables effecting airbag deployment. The trim cover type, such as cloth, vinyl, leather, etc., and combinations of these various types all behave differently and have different tensile and tear strength. In addition, different materials of the same types such as different woven fabrics have different tensile strengths, tear strengths, weave nap direction, etc. which can effect the manner in which an airbag deploys through the trim cover if the airbag deploys by rupturing the trim cover. Other variables introduced by the trim cover include the strength of the trim cover scrim layer or backing, and the strength of the thin layer of foam that is typically laminated to the underside of the trim cover outer layer.

[0004] Wear of the trim cover material over time and damage to the trim cover by cutting, puncturing, cigarette burns, etc., also introduces variables in airbag deployment. For example, a cut in the trim cover at a location other than the intended deployment location can cause the trim cover to rupture at the wrong location, resulting in the airbag being out of position or taking more time to reach its position.

[0005] One approach to reduce some of the variables caused when deploying an airbag through the trim cover is to deploy the airbag through a seam in the cover rather than rupturing the cover material itself, as shown in the EP 0 709 429 reference (on which the preamble of claims 1 and 16 is based), the EP 0 782 944 reference, and the EP 0 768 215 reference. In the EP 0 769 429 reference, the seat upholstery in the area over the airbag module is provided with tear seams such that the inflating cushion will burst through the upholstery. In the EP 0 782 944 reference, the side air bag device is imbedded in a seat side portion for expanding an airbag by rip-opening a sutured portion of the seat skin material by virtue of the expansion pressure of the air bag. Finally, in the EP 0 768 215 reference, a front seat surface layer and a side seat surface layer are sewn together using a sewing thread at a seam. The seam is located at a position roughly facing the perforation of the lining member, such that the seat surface layer instantaneously ruptures at the seam when the air bag deploys. While this approach of seam deployment reduces variability, it limits seat styling by dictating where the seam is located.

[0006] It is an object of the present invention to provide a trim cover for a vehicle seat with an airbag in which the airbag deploys by rupturing the trim cover by reducing the variability in trim cover rupture to achieve a consistent and predictable airbag deployment.

[0007] To accomplish the above, the trim cover employs a reinforcement in the region of the trim cover overlying the inflatable airbag. The reinforced region has a weakened zone forming a tear line for directing deployment of the airbag through a predetermined location in the trim cover. By reinforcing the trim cover in the region overlying the airbag and surrounding the weakened zone, the trim cover is shielded or protected from the inflation forces except for the weakened zone forming the tear line. This tear line thus becomes the "weak link" in the trim cover, resulting in the trim cover rupturing at the tear seam as oppose to other nearby locations.

In a preferred embodiment of the invention, the trim cover is reinforced by the provision of a layer of sheet material to the inner side of the trim cover forming a reinforcing panel. The reinforcing panel has a higher strength and is less stretchable than the outer surface layer of the trim cover. Preferably, the reinforcing panel is a low strength material compared. to the outer layer. A known material for this application is the same material used in the airbag which naturally must withstand the airbag inflation forces without failure. Other high strength sheet materials may be used as well. Preferably, the reinforcing panel is laminated to the trim cover material. The reinforcing panel is cut along a line which may be straight or of irregular shape to provide the weakened zone in the trim cover.

[0008] In a typical construction, the trim cover material has an outer surface layer and a thin layer of foam. The reinforcing panel layer is positioned on the inner surface of the foam layer. The tear line is preferably formed by cutting both the reinforcing panel and through the foam layer. One method of manufacturing the trim cover is to first laminate the outer layer, foam and reinforcing panel to one another and then laser cut the reinforcing panel and the foam layer along the tear line. Depending on the particular application, the laser cut may partially penetrate into outer layer material itself. Alternatively, the cut may only partially penetrate through the foam or may only penetrate through the reinforcing layer. In another alternative, the laser cut may penetrate partially into the outer layer, weakening it as well.

[0009] In the preferred embodiment, the layers of the trim cover are laminated together and then laser cut to form the weakened zone. It is possible to precut the various layers and then join them together with the cut lines aligned with one another. As an alternative, the reinforcing panel may be joined to the other layers only at the perimeter of the reinforcing panel.

[0010] The function of the reinforcing layer is to strengthen and reduce the stretch of the trim cover in the region surrounding the tear line. A high strength and low stretchable material such as airbag fabric will perform this function. However, the same function may be achieved with a reinforcing material that is merely less stretchable than the outer layer material. Such a material, when cut to form the weakened zone and laminated to the outer layer, will result in the outer layer stretching more at the tear line than the surrounding area. Thus the outer layer will fail at the tear line when the airbag deploys. Furthermore, the reinforcing layer may not need to be high strength material. As long as the combination of the reinforcing layer and the outer layer is stronger than the outer layer by itself, the combined layers with the weakened zone in the reinforcing layer will result in failure at the tear line created by the weakened zone in the reinforcing layer.

[0011] Further objects, features and advantages of the invention will become apparent from a consideration of the following description and the appended claims when taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

FIG. 1 is a perspective view of a vehicle seat assembly of the present invention with a trim cover having a reinforced region over an inflatable airbag with a weakened zone in the reinforcing panel forming a tear line;

FIG. 2 is a cross-sectional view through the side bolster of the seat shown in FIG. 1 as seen substantially the line 2-2 in FIG. 1;

FIG. 3 is a side view of the seat cover trim panel covering the bolster and overlying the airbag;

FIG. 4 is an enlarged sectional view of the trim cover panel from the circle 4 in FIG. 3 illustrating the multiple layer structure of the time cover piece overlaying the airbag and the weakened zone therein; and

FIG. 5 is a side view like FIG. 3 of an alternative embodiment of the invention in which the weakened zone is formed by a series of short cuts in the inner layer as opposed to a continuous cut.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] A seat assembly according to the present invention is shown in FIG. 1 and designated generally at 10. The seat assembly 10 includes a lower, generally horizontal seat bottom 12 forming a generally horizontal seating surface 14. A seat back 16 extends generally upwardly at the rear end of the seat bottom 12. The seat back forms an upright seating surface 18 against which a seat occupant rests their torso. The seat bottom has left and right side bolsters 20 while the seat back has left and right side bolster 22. The seat assembly can include an inflatable airbag at various locations such as the side bolsters of either the side bottom or seat back for side impact protection or in the seat back to protect a rear passenger. The invention will be described below in connection with a side airbag mounted to the seat back in the right bolster 22. The invention can be utilized at any location in the trim cover desired for an airbag to deploy therethrough.

[0014] The seat back 16 includes a trim cover 24 which is made of a plurality of pieces of sheet material joined together at seams such as the seams 26 and 28. The number and location of the seams is determined partially by functional considerations to form a tight, form fitting trim cover and also by stylistic considerations.

[0015] The trim cover piece 30 which covers all or a portion of the right side bolster 22 of the seat back is formed with a reinforcing panel as described below and which has a weakened zone forming a tear line shown by the broken line 32 in FIG. 1. As described below, it will be seen that the. tear line 32 is not visible on the surface of the vehicle seat.

[0016] With reference to FIG. 2, the construction of the seat back is shown in greater detail. The seat back includes a frame 34 that provides the structural support for the seat back. The frame supports a pad 36 such as a urethane foam pad, rubberized hair pad, etc. The pad is, in turn, covered by the trim cover 24. The portion of the trim cover covering the right bolster 22 is the trim cover piece 30. The trim cover piece 30 is joined to a trim cover piece 38 in the front center of the seat back at the seam 28. The trim cover piece 30 extends around the bolster to the rear of the seat back where it is joined to another piece of trim cover 40 at the seam 42.

[0017] A mounting bracket 56 attached to the frame

34 is used to mount a side airbag module 58. The airbag module includes a housing 60 with one or more threaded studs 62 that pass through apertures (not shown) in the bracket 56 and are attached thereto by nuts 64 to mount the module to the bracket 56. The module 58 further includes a folded airbag 70 and an inflator 68 that provides gas for inflating the airbag. A thin sheet 72 covers the folded airbag and holds the airbag in place during shipping and handling of the module. The sheet 72 is designed to rupture during deployment of the airbag without affecting the airbag deployment. The illustrated airbag module 58 is only exemplary of many modules that could be used with the invention. The specific structure and components of the module illustrated do not form the present invention other than the provision an inflatable airbag in the seat assembly. The pad 36 may or may not completely cover the airbag. The pad may have a slot 59 forming a passage for the airbag through the pad. Depending on the location of the airbag module and the intended deployment location in the trim cover, it may be possible and preferred to position the airbag directly behind the trim cover without any pad covering the airbag.

[0018] FIG. 3 illustrates the trim cover piece 30 showing the tear line 32. The perimeter of the trim cover has a plurality of notches 46 which are used in aligning the trim cover piece 30 with adjacent pieces of the trim cover for joining the trim cover pieces together. In addition, these notches can be used for alignment of the trim cover piece 30 within a fixture used during cutting to form the tear line 32.

[0019] The trim cover piece 30 is shown in greater detail in FIG. 4. In a preferred embodiment, it is constructed of three layers. The first is the outer layer 48. This may be a woven fabric, leather, synthetic sheet materials such as vinyl, or other material used to form the exterior surface of the seat assembly. Joined to the underside of the outer layer 48 is a thin foam layer 50. The foam layer 50 provides a smooth contour to the trim cover at the transition zones and where the trim cover is wrapped around a curved surface. A reinforcing panel 52 is applied to the opposite surface of the foam layer. The reinforcing panel 52 is made of a flexible sheet material to conform to the contours of the trim cover. The panel is less stretchable than the outer layer 48 and may be a low stretchable material. The reinforcing panel may also be a high strength material to withstand the inflation forces of the airbag 70 without rupture of the reinforcing panel. A preferred material for the reinforcing panel is the same material used to manufacture the airbag such as a nylon material. However, lower strength materials may be used if the combined outer and reinforcing layers are stronger than the outer layer itself.

[0020] The trim cover piece 30 is formed with a weakened zoned to create a tear line 32. The weakened zone is formed by a cut in the reinforcing panel 52 at the intended deployment location of the airbag. As shown in FIG. 4, the tear line 32 also extends through the foam layer 50 and partially into the outer layer 48. Penetration of 10 or 20 percent into the outer layer is believed to have no or little impact on the wear of the outer layer. The depth of the cut may vary from one application to another. At one end of the range of depths, the cut only penetrates the reinforcing panel 52. At the other end of the range it penetrates through all but the outer layer and partially through the outer layer.

[0021] The cut in the reinforcing layer may be a continuous cut as shown in FIG. 3 or it may be a series of short, spaced apart cuts along a line 32' as shown in FIG. 5. The partial penetration into the outer layer may also be a continuous cut or short, spaced cuts as well. Alternatively, the reinforcing panel may have a continuous cut while the outer layer has a series of short, spaced apart cuts.

[0022] As the airbag inflates, it rapidly increases in volume and pushes outward on the trim cover. As shown by the arrows F in FIG. 4, the outward push of a trim cover is somewhat uniform in the area surrounding the tear line 32. Since the edges of the trim cover piece 30 are joined to the seat, the outward force F will cause tension in the trim cover piece shown by the arrows T. This will cause stretching of the trim cover until the trim cover ruptures enabling the airbag to penetrate therethrough. The presence of the reinforcing layer 52, which is less stretchable than the outer layer, prevents, or at least, reduces stretch in the outer layer 48 except in the region of the outer layer overlying the tear line 32. This area will receive the maximum degree of stretching, resulting in rupture or tearing of the trim cover at the line 32.

[0023] In a preferred embodiment of the invention, the trim cover piece 30 is first formed by laminating the reinforcing panel 52 to the foam and outer layers. The tear line 32 is subsequently formed by laser cutting. The trim cover piece 30 is placed in a fixture to hold it in place whereby the laser cut can be controlled as to its location and depth. It is also possible to manufacture the trim cover piece 30 by first cutting the reinforcing panel 32 and the foam 50 and then laminating the layers together with the cut lines aligned with one another. Pre-cutting each layer may facilitate the cutting by allowing other cutting methods to be used. It does add complexity to the process since proper alignment of the cut lines must be maintained when the layers are joined together.

[0024] The foam layer 50 is optional. The reinforcing layer 52 can be placed directly against the outer layer 48. Alternatively, the reinforcing layer 52 may be placed between the outer layer 48 and the foam layer 50. Other layers may be included in the trim cover piece 30 as desired. The reinforcing layer is referred to as an "inner reinforcing layer" in the claims to designate that the reinforcing layer is inside the outer layer of the trim cover. There may be other layers yet inside of the reinforcing layer and between the outer layer and the reinforcing layer. While in a preferred embodiment the multiple layers of the trim cover are laminated to one another, it is

possible to form the trim cover by joining the reinforcing panel to the outer layer only at the perimeter of the reinforcing panel, such as at the seams 28 and 42 as shown in FIG. 2. With such a construction, the reinforcing panel would still function to reduce the stretching of the outer layer at locations other than the tear line 32. Preferably the reinforcing panel extends between two of the attachments of the trim cover to the seat. The piece 30 is attached to the seat wire 47 at the seam 28 and to the frame 34 at seam 42.

[0025] The reinforcing panel has been shown as being the same size as the outer layer of the piece 30 of the trim cover. It may be possible to use a reinforcing panel which is smaller, such as a strap, covering the region overlaying the airbag and possibly extending to the adjacent trim cover tie down locations.

[0026] The invention provides for a predictable and repeatable deployment of an airbag through the seat trim cover. This is accomplished by providing a reinforcing panel in the trim cover in a region overlying the airbag module. A weakened zone is formed in the reinforcing panel to form a tear line through the trim cover. The reinforcing panel is made out of a material that is less stretchable than the outer layer. As a result, when the trim cover is loaded in tension from a deploying airbag, the region of the outer layer overlying the weakened zone, in the reinforcing panel, will stretch more than the areas surrounding the weakened zone. As a result, failure of the outer layer of the trim cover will occur at the tear line. The reinforcing panel, when joined to the outer layer of the trim cover, must have a strength greater than the outer layer itself such that the outer layer will fail at the tear line when the airbag deploys.

[0027] It is to be understood that the invention is not limited to the exact construction illustrated and described above, but that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the following claims.

Claims

1. A trim cover (24) for a vehicle seat assembly (10) having an inflatable airbag (58) at least partially surrounded by a pad (36), the trim cover having multiple pieces joined to one another, one piece (30) of the multiple pieces being located in a region overlying the inflatable airbag,
characterized by:

   the one piece having a flexible outer layer (48), a flexible inner reinforcing layer (52) being connected to the flexible outer layer and being less smetchable than the flexible outer layer, and a weakened zone being defined by the flexible inner reinforcing layer the weakened zone forming a tear line (32) which fails from tensile stress (I) when subjected to airbag inflation forces (F) caused by the inflatable airbag.

2. The trim cover of claim 1 **characterized by** the weakened zone being a cut extending through the inner reinforcing layer.

3. The trim cover of claim 2 **characterized by** the cut in the inner reinforcing layer being a continuous cut along a predetermined path.

4. The trim cover of claim 2 **characterized by** the cut in the inner reinforcing layer being a series of short, spaced apart cuts along a predetermined path.

5. The trim cover of claim 2 **characterized by** the inner reinforcing layer being made of a material used to manufacture the airbag.

6. The trim cover of claim 1 **characterized by** the one piece further including an intermediate layer (50), whereby the one piece is a multiple layer structure and the inner reinforcing layer has a cut extending through all but the outer layer of the multiple layer structure to form the weakened zone.

7. The trim cover of claim 6 **characterized by** the inner reinforcing layer being laminated to the intermediate layer of the multiple layer struoture over substantially an entire surface of the inner reinforcing layer.

8. The trim cover of claim 6 **characterized by** the inner reinforcing layer being joined to one of the outer layer and the intermediate flyer of the multiple layer structure along a perimeter of the inner reinforcing layer.

9. The trim cover of claim 8 **characterized by** the inner reinforcing layer being joined to one of the outer layer and the intermediate layer at seams (28) in the trim cover.

10. The trim cover of claim 2 **characterized by** the inner reinforcing layer being attached to one or more locations of the vehicle seat assembly.

11. The trim cover of claim 1 **characterized by** the inner reinforcing layer having a laser cut extending through the inner reinforcing layer to form the weakened zone.

12. The trim cover of claim 1 **characterized by** the one piece being a multiple layer structure having an outer layer, an inner reinforcing layer, and a foam layer (50) between the inner reinforcing layer and the outer layer with a cut extending through the inner reinforcing layer to form the weakened zone.

13. The trim cover of claim 12 **characterized by** the cut extending through all layers of the multiple layer structure but the outer layer.

14. The trim cover of claim 12 **characterized by** the cut further extending to partially penetrate the outer layer.

15. The trim cover of claim 14 **characterized by** the cut into the outer layer being a series of short, spaced apart cuts into the outer layer along a predetermined path.

16. A method of making a trim cover (24) for a vehicle seat assembly (10) having an inflatable airbag (58) at least partially surrounded by a pad (36), including the steps of cutting multiple pieces of a flexible sheet material, joining the pieces together to form the trim cover of a size and shape to fit over the vehicle seat assembly and form an exterior surface of the seat assembly, **characterized by** the following steps:

    (a) providing one piece (30) of the multiple pieces with a flexible outer layer (48), a flexible inner reinforcing layer (52) of a material which is less stretchable than the flexible outer layer;
    (b) locating the one piece in a region of the trim cover overlying the inflatable airbag; and
    (c) forming a weakened zone in the inner reinforcing layer of the one piece to create a tear line (32) which fails from tensile stress (T) when subjected to airbag inflation forces (F) caused by the inflatable airbag.

17. The method of claim 16 **characterized by** step (c) being performed by cutting all but the outer layer of the one piece to form the weakened zone.

18. The method of claim 16 **characterized by** step (c) being performed by cutting all but the outer layer of the one piece entirely through and by cutting the outer layer partially through to form the weakened zone.

19. The method of claim 16 **characterized by** step (c) being pezformed by a laser.

20. The method of claim 16 **characterized by** the following step: (d) laminating the inner reinforcing layer to the outer layer to form the one piece.

21. The method of claim 20 **characterized by** step (c) being performed after step (d).

22. The method of claim 20 **characterized by** step (c) being performed before step (d).

Patentansprüche

1. Überzug (24) für einen Fahrzeugsitzaufbau (10) mit einem aufblasbaren Airbag (58), der zumindest teilweise durch ein Polster (36) umgeben ist, wobei der Überzug mehrere miteinander verbundene Elemente aufweist, wobei ein Element (30) der mehreren Elemente in einem Bereich zu liegen kommt, der über dem aufblasbaren Airbag liegt, **dadurch gekennzeichnet, dass**
das eine Element eine flexible Außenschicht (48), eine flexible innere Verstärkungsschicht (52), die mit der flexiblen Außenschicht verbunden und weniger dehnbar als die flexible Außenschicht ist, und eine Schwächungszone aufweist, die durch die flexible innere Verstärkungsschicht festgelegt ist, wobei die Schwächungszone eine Reißlinie (32) bildet, die durch Zugspannung (T) aufbricht, wenn sie Airbag-Aufblaskräften (F) unterworfen ist, die durch den aufblasbaren Airbag hervorgerufen sind.

2. Überzug nach Anspruch 1, **dadurch gekennzeichnet, dass** die Schwächungszone ein Schnitt ist, der sich durch die innere Verstärkungsschicht erstreckt.

3. Überzug nach Anspruch 2, **dadurch gekennzeichnet, dass** der Schnitt in der inneren Verstärkungsschicht ein kontinuierlicher Schnitt entlang einem vorbestimmten Pfad ist.

4. Überzug nach Anspruch 2, **dadurch gekennzeichnet, dass** der Schnitt in der inneren Verstärkungsschicht aus einer Reihe von kurzen, voneinander beabstandeten Schnitten entlang einem vorbestimmten Pfad besteht.

5. Überzug nach Anspruch 2, **dadurch gekennzeichnet, dass** die innere Verstärkungsschicht aus einem Material hergestellt ist, das zur Herstellung des Airbag verwendet wird.

6. Überzug nach Anspruch 1, **dadurch gekennzeichnet, dass** das eine Element außerdem eine Zwischenschicht (50) enthält, wobei das eine Element eine Mehrschichtstruktur ist, und wobei die innere Verstärkungsschicht einen Schnitt aufweist, der sich durch sämtliche der mehreren Schichten bis auf die Außenschicht erstreckt, um die Schwächungszone zu bilden.

7. Überzug nach Anspruch 6, **dadurch gekennzeichnet, dass** die innere Verstärkungsschicht der Mehrschichtstruktur über im wesentlichen die gesamte Fläche der inneren Verstärkungsschicht laminiert ist.

8. Überzug nach Anspruch 6, **dadurch gekennzeich-**

net, dass die innere Verstärkungsschicht entweder mit der Außenschicht oder der Zwischenschicht der Mehrschichtstruktur entlang einem Perimeter der inneren Verstärkungsschicht verbunden ist.

9. Überzug nach Anspruch 8, **dadurch gekennzeichnet, dass** die innere Verstärkungsschicht mit entweder der Außenschicht oder der Zwischenschicht an Nähten (28) im Überzug verbunden ist.

10. Überzug nach Anspruch 2, **dadurch gekennzeichnet, dass** die innere Verstärkungsschicht an einer oder mehreren Stellen in dem Fahrzeugsitzaufbau angebracht ist.

11. Überzug nach Anspruch 1, **dadurch gekennzeichnet, dass** die innere Verstärkungsschicht einen Laserschnitt aufweist, der sich durch die innere Verstärkungsschicht zur Bildung der Schwächungszone erstreckt.

12. Überzug nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Element eine Mehrschichtstruktur mit einer Außenschicht, einer inneren Verstärkungsschicht und einer Schaumschicht (50) zwischen der inneren Verstärkungsschicht und der Außenschicht mit einem Schnitt ist, der sich durch die innere Verstärkungsschicht zur Bildung der Schwächungszone erstreckt.

13. Überzug nach Anspruch 12, **dadurch gekennzeichnet, dass** der Schnitt sich durch sämtliche Schichten der Mehrschichtstruktur bis auf die Außenschicht erstreckt.

14. Überzug nach Anspruch 12, **dadurch gekennzeichnet, dass** der Schnitt sich außerdem so erstreckt, dass er teilweise in die Außenschicht eindringt.

15. Überzug nach Anspruch 14, **dadurch gekennzeichnet, dass** der Schnitt in die Außenschicht aus einer Reihe von kurzen, voneinander beabstandeten Schnitten in die Außenschicht entlang einem vorbestimmten Pfad besteht.

16. Verfahren zur Herstellung eines Überzugs (24) für einen Fahrzeugsitzaufbau (10) mit einem aufblasbaren Airbag (58), der zumindest teilweise durch ein Polster (36) umgeben ist, aufweisend die Schritte, mehrere Elemente eines flexiblen Flachmaterials zu schneiden, die Elemente miteinander zu verbinden, um den Überzug einer Größe und Form zu bilden, damit er über den Fahrzeugsitzaufbau passt, und eine Außenfläche des Sitzaufbaus zu bilden, **gekennzeichnet durch** die folgenden Schritte:

(a) Versehen von einem Element (30) der mehreren Elemente mit einer flexiblen Außenschicht (48), einer flexiblen inneren Verstärkungsschicht (52) aus einem Material, das weniger dehnbar ist als die flexible Außenschicht;
(b) Anordnen des einen Elements in einem Bereich des Überzugs, der über dem aufblasbaren Airbag zu liegen kommt; und
(c) Bilden einer Schwächungszone in der inneren Verstärkungsschicht des einen Elements zur Erzeugung einer Reißlinie (32), die **durch** Zugspannung (T) aufbricht, wenn sie Airbag-Aufblaskräften (F) unterworfen ist, die **durch** den aufblasbaren Airbag hervorgerufen sind.

17. Verfahren nach Anspruch 16, **dadurch gekennzeichnet, dass** der Schritt (c) durchgeführt wird durch Schneiden sämtlicher Schichten mit Ausnahme der Außenschicht des einen Teils zur Bildung der Schwächungszone.

18. Verfahren nach Anspruch 16, **dadurch gekennzeichnet, dass** der Schritt (c) durchgeführt wird durch vollständiges Durchschneiden sämtlicher Schichten bis auf die Außenschicht des einen Elements und teilweises Durchschneiden der Außenschicht zur Bildung der Schwächungszone.

19. Verfahren nach Anspruch 16, **dadurch gekennzeichnet, dass** der Schritt (c) durch einen Laser durchgeführt wird.

20. Verfahren nach Anspruch 16, **gekennzeichnet durch** den folgenden Schritt: (d) Laminieren der inneren Verstärkungsschicht auf die Außenschicht zur Bildung des einen Elements.

21. Verfahren nach Anspruch 20, **dadurch gekennzeichnet, dass** der Schritt (c) nach dem Schritt (d) durchgeführt wird.

22. Verfahren nach Anspruch 20, **dadurch gekennzeichnet, dass** der Schritt (c) vor dem Schritt (d) durchgeführt wird.

Revendications

1. Revêtement d'habillage (24) pour un ensemble de siège de véhicule (10) comportant un coussin de sécurité gonflable (58) au moins partiellement entouré par un coussin (36), le revêtement d'habillage comportant de multiples pièces unies les unes aux autres, une pièce (30) des multiples pièces étant située dans une région recouvrant le coussin de sécurité gonflable, **caractérisé par**:

ladite une pièce comportant une couche exté-

rieure souple (48), une couche de renforcement intérieure souple (52) étant reliée à la couche extérieure souple et étant moins extensible que la couche extérieure souple, et une zone fragilisée étant définie par la couche de renforcement intérieure souple, la zone fragilisée formant une ligne de déchirure (32) qui cède à une contrainte de traction (T) lorsqu'elle est soumise aux forces de gonflage de coussin de sécurité (F) provoquées par le coussin de sécurité gonflable.

2. Revêtement d'habillage selon la revendication 1, **caractérisé en ce que** la zone fragilisée consiste en une incision s'étendant à travers la couche de renforcement intérieure.

3. Revêtement d'habillage selon la revendication 2, **caractérisé en ce que** l'incision dans la couche de renforcement intérieure consiste en une incision continue le long d'un trajet prédéterminé.

4. Revêtement d'habillage selon la revendication 2, **caractérisé en ce que** l'incision dans la couche de renforcement intérieure consiste en une série de courtes incisions espacées le long d'un trajet prédéterminé.

5. Revêtement d'habillage selon la revendication 2, **caractérisé en ce que** la couche de renforcement intérieure est réalisée en un matériau utilisé pour fabriquer le coussin de sécurité.

6. Revêtement d'habillage selon la revendication 1, **caractérisé en ce que** ladite une pièce comprend, en outre, une couche intermédiaire (50), de telle manière que ladite une pièce soit une structure à couches multiples, et que la couche de renforcement intérieure comporte une incision s'étendant à travers toute la structure à couches multiples à l'exception de la couche extérieure afin de former la zone fragilisée.

7. Revêtement d'habillage selon la revendication 6, **caractérisé en ce que** la couche de renforcement intérieure est lamifiée sur la couche intermédiaire de la structure à couches multiples sur une surface sensiblement entière de la couche de renforcement intérieure.

8. Revêtement d'habillage selon la revendication 6, **caractérisé en ce que** la couche de renforcement intérieure est unie à l'une de la couche extérieure et de la couche intermédiaire de la structure à couches multiples le long d'un périmètre de la couche de renforcement intérieure.

9. Revêtement d'habillage selon la revendication 8, **caractérisé en ce que** la couche de renforcement intérieure est unie à l'une de la couche extérieure et de la couche intermédiaire au niveau de coutures (28) dans le revêtement d'habillage.

10. Revêtement d'habillage selon la revendication 2, **caractérisé en ce que** la couche de renforcement intérieure est fixée à un ou plusieurs emplacements de l'ensemble de siège de véhicule.

11. Revêtement d'habillage selon la revendication 1, **caractérisé en ce que** la couche de renforcement intérieure comporte une incision par laser s'étendant à travers la couche de renforcement intérieure afin de former la zone fragilisée.

12. Revêtement d'habillage selon la revendication 1, **caractérisé en ce que** ladite une pièce est une structure à couches multiples comportant une couche extérieure, une couche de renforcement intérieure et une couche de mousse (50) entre la couche de renforcement intérieure et la couche extérieure avec une incision s'étendant à travers la couche de renforcement intérieure afin de former la zone fragilisée.

13. Revêtement d'habillage selon la revendication 12, **caractérisé en ce que** l'incision s'étend à travers toutes les couches de la structure à couches multiples à l'exception de la couche extérieure.

14. Revêtement d'habillage selon la revendication 12, **caractérisé en ce que** l'incision s'étend, en outre, de manière à pénétrer partiellement dans la couche extérieure.

15. Revêtement d'habillage selon la revendication 14, **caractérisé en ce que** l'incision dans la couche extérieure consiste en une série de courtes incisions espacées dans la couche extérieure le long d'un trajet prédéterminé.

16. Procédé de réalisation d'un revêtement d'habillage (24) pour un ensemble de siège de véhicule (10) comportant un coussin de sécurité gonflable (58) au moins partiellement entouré par un coussin (36), comprenant les étapes consistant à découper de multiples pièces d'un matériau en feuille souple, unir les pièces les unes aux autres afin de former le revêtement d'habillage d'une dimension et d'une forme telles qu'il s'ajuste sur l'ensemble de siège de véhicule et qu'il forme une surface extérieure de l'ensemble de siège, **caractérisé par** les étapes suivantes :

(a) la réalisation d'une pièce (30) des multiples pièces avec une couche extérieure souple (48), une couche de renforcement intérieure souple

(52) d'un matériau qui est moins extensible que la couche extérieure souple ;
(b) positionner ladite une pièce dans une région du revêtement d'habillage recouvrant le coussin de sécurité gonflable ; et
(c) former une zone fragilisée dans la couche de renforcement intérieure de ladite une pièce afin de créer une ligne de déchirure (32) qui cède à une contrainte de traction (T) lorsqu'elle est soumise aux forces de gonflage de coussin de sécurité (F) provoquées par le coussin de sécurité gonflable.

17. Procédé selon la revendication 16, **caractérisé en ce que** l'étape (c) est exécutée en incisant ladite une pièce entière à l'exception de la couche extérieure afin de former la zone fragilisée.

18. Procédé selon la revendication 16, **caractérisé en ce que** l'étape (c) est exécutée en incisant entièrement ladite une pièce entière à l'exception de la couche extérieure et en incisant partiellement la couche extérieure afin de former la zone fragilisée.

19. Procédé selon la revendication 16, **caractérisé en ce que** l'étape (c) est exécutée par un laser.

20. Procédé selon la revendication 16, **caractérisé par** l'étape suivante :

(d) lamifier la couche de renforcement intérieure sur la couche extérieure afin de former ladite une pièce.

21. Procédé selon la revendication 20, **caractérisé en ce que** l'étape (c) est exécutée après l'étape (d).

22. Procédé selon la revendication 20, **caractérisé en ce que** l'étape (c) est exécutée avant l'étape (d).

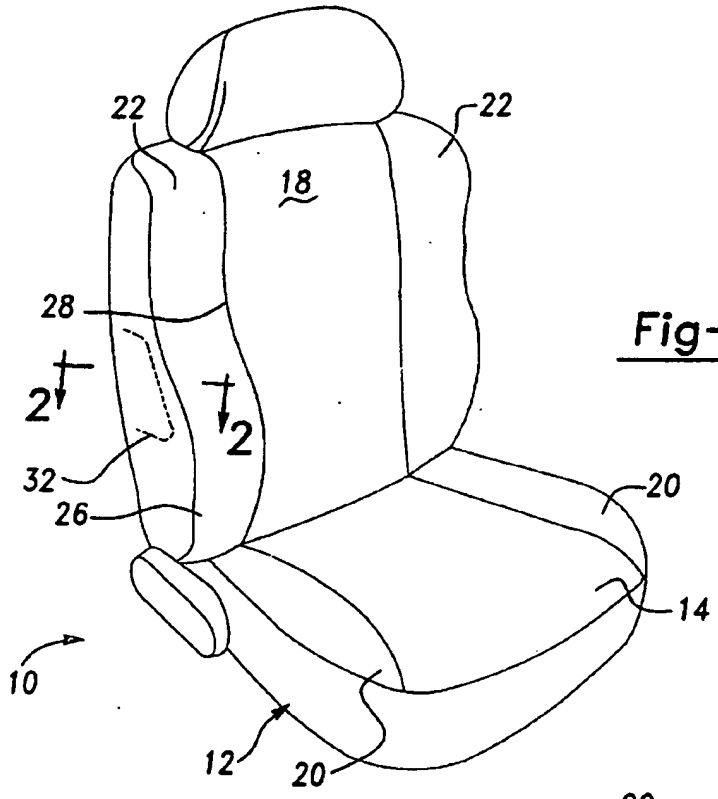
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Fig-1

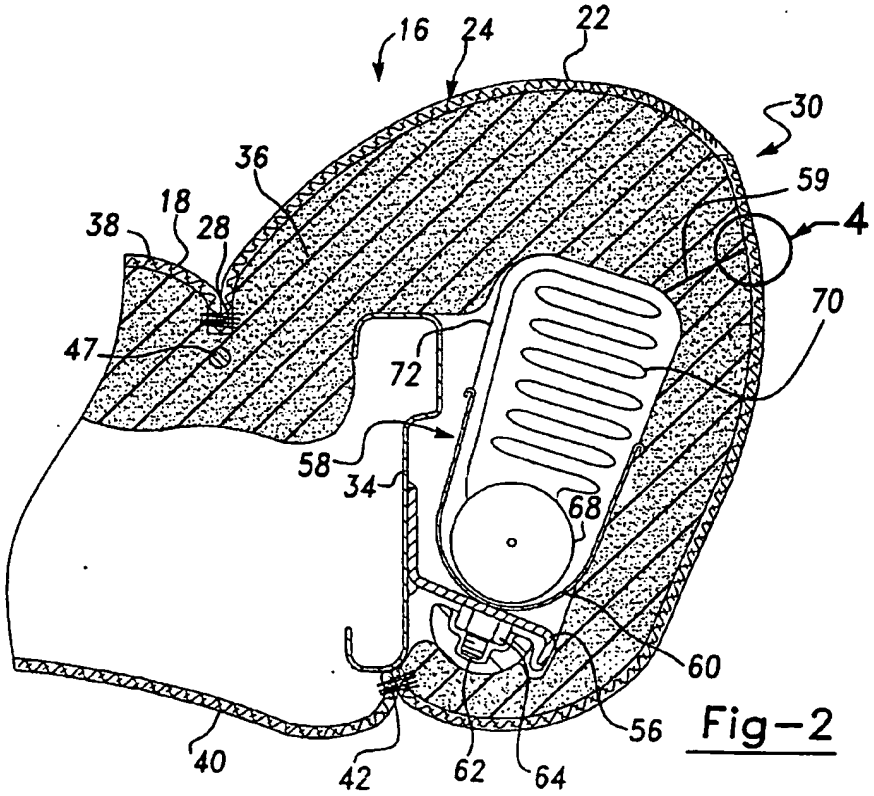
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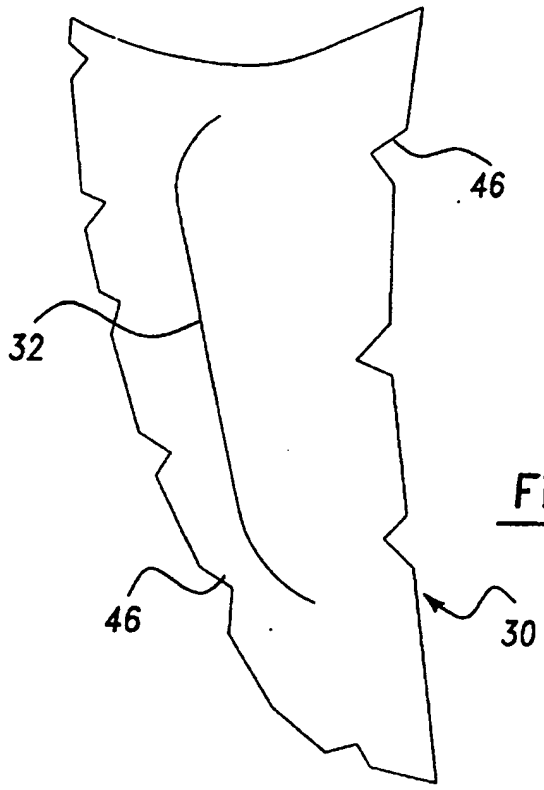
Fig-2



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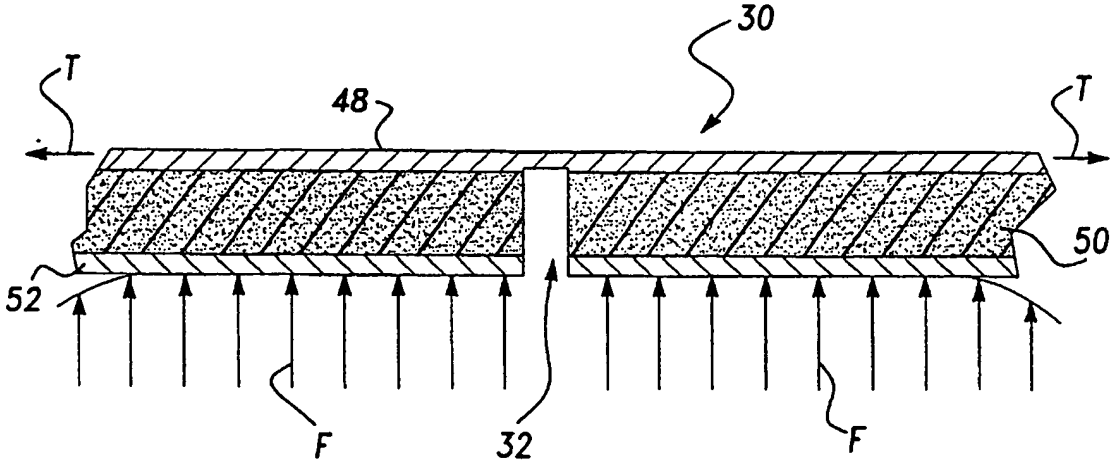

Fig-4

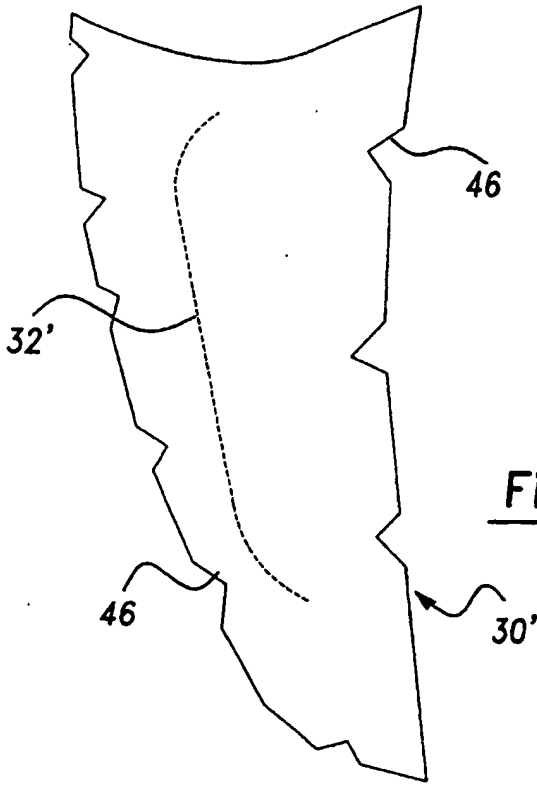

Fig-5

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